

CLAIMS

1. A power generator system comprising:

a power module for receiving an electrical energy input and generating an electrical energy output, the power module having a digital control input;

a sensor module for monitoring the output of the power module, the sensor module having a digital sensor output and generating a digital sensor signal on the digital sensor output that varies in accordance with the electrical energy output; and

a control module having a digital measurement input for receiving the sensor signal, the control module determining parameters that vary in accordance with the electrical energy output, the control module including a digital control output connected to the digital control input, the control module generating a control signal applied to the digital control input for controlling the power module.

2. The power generator system of claim 1 further comprising a data link interconnecting at least a pair of the sensor module, the control module, the power module, an AC input module, and an input/output adapter module to enable communications therebetween.

3. The power generator system of claim 2 wherein the data link further comprises one of a low voltage differential communications link, a fiber optic communications link, an infrared communications link, a line of sight optical communications link, and a wireless communications link.

4. The power generator system of claim 2 wherein the data link implements a predetermined communications protocol.

5. The power generator system of claim 2 wherein the communications protocol includes error detection.

6. The power generator system of claim 1 wherein the modules are interconnected in a communications network.

7. The power generator system of claim 1 further comprising a plurality of power modules, each power module receiving an electrical energy input and generating an electrical energy output, each power module having a digital control input, each digital control input receiving a control signal from the measurement module for varying the electrical energy output.

8. The power generator system of claim 7 further comprising a power combiner, the power combiner receiving the electrical energy output from at least two of the plurality of power modules and generating a combined electrical energy output in accordance therewith.

9. A power delivery system receiving an input power and generating an output power to a load comprising:

    a power generator, the power generator receiving the input power and generating the output power, the power generator including a first digital interface;

    an impedance matching network interposed between the power generator and the load, the impedance matching network including a second digital interface;

    an output sensor disposed in proximity to the load for sensing a parameter associated with the power generator output, the output sensor including a third digital interface and generating a digital sensor signal via the third digital interface that varies in accordance with the sensed parameter; and

    a controller receiving the sensor signal and determining a control signal for output to the power generator, the controller including a fourth digital interface which receives the sensor signal and generating the control signal via the fourth digital interface for communications with the first digital interface, wherein the power generator varies the output power in accordance with the control signal.

10. The power delivery system of claim 9 wherein the power generator further comprises:

a power module for receiving an electrical energy input and generating an electrical energy output, the power module including a fifth digital interface;

a sensor module for monitoring the output of the power module, the sensor module having a sixth digital interface and generating a digital sensor signal on the sixth digital sensor interface that varies in accordance with the electrical energy output; and

a control module having a seventh digital interface for receiving the sensor signal via the sixth digital interface, the control module determining parameters that vary in accordance with the electrical energy output, the seventh digital interface and the fifth digital interface being interconnected, wherein the control module generates a control signal for output through the seventh digital interface for input to the power module via the fifth digital interface.

11. The power delivery system of claim 9 further comprising a plurality of power modules, each power module receiving an electrical energy input and generating an electrical energy output, each power module having a fifth digital interface, each fifth digital interface receiving a control signal from the measurement module for varying the electrical energy output.

12. The power delivery system of claim 11 further comprising a power combiner, the power combiner receiving the electrical energy output from at least two of the plurality of power modules and generating a combined electrical energy output in accordance therewith.

13. The power delivery system of claim 9 further comprising a digital data link interconnecting at least two digital interfaces to enable communications between the respective digital interfaces.

14. The power delivery system of claim 13 wherein the data link further comprises one of a low voltage differential communications link, a fiber optic communications link, an infrared communications link, a line of sight optical communications link, and a wireless communications link.

15. The power delivery system of claim 13 wherein the power generator, the impedance matching network, the output sensor, and the controller are interconnected in a network to enable communications therebetween.

16. The power delivery system of claim 9 further comprising an alternating current (AC) input module, the AC input module receiving an AC signal and delivering a DC signal to the controller, the AC input module having a fifth digital interface and exchanging at least one of data and control commands with the controller via the fourth digital interface.

17. A power delivery system receiving an input power and generating an output power to a load comprising:

    a power generator, the power generator receiving the input power and generating the output power;

    an impedance matching network interposed between the power generator and the load;

    an output sensor disposed in proximity to the load for sensing a parameter associated with the output power, the output sensor generating a digital sensor signal that varies in accordance with the sensed parameter;

    a controller receiving the sensor signal and determining a digital control signal for output to the power generator, wherein the power generator varies the output power in accordance with the control signal; and

    a digital interface interconnecting the controller and at least one of the power generator, the impedance matching network, and the output sensor, wherein the digital sensor signal and the digital control signal are communicated via the digital interface.

18. The power delivery system of claim 17 wherein the digital interface comprises one of a low voltage differential communications link, a fiber optic communications link, an infrared communications link, a line of sight optical communications link, and a wireless communications link.

19. The power delivery system of claim 17 wherein the power generator, the impedance matching network, the output sensor, and the controller digital interface defines a network interconnecting the network.

20. A power generator system comprising:

    a power module for receiving an electrical energy input and generating an electrical energy output, the power module having a digital communications port;

    a sensor module for monitoring the output of the power module, the sensor module having a digital communications port and generating a digital sensor signal on the digital communications port output that varies in accordance with the electrical energy output;

    a digital interface interconnecting the power module and the sensor module to enable digital communications therebetween; and

    a control module having a digital measurement input for receiving the sensor signal, the control module determining parameters that vary in accordance with the electrical energy output, the control module generating a control signal for controlling the power module.

21. The power generator system of claim 20 wherein the digital interface comprises one of a low voltage differential communications link, a fiber optic communications link, an infrared communications link, a line of sight optical communications link, and a wireless communications link.

22. The power generator system of claim 20 wherein the digital interface implements a predetermined communications protocol.

23. The power generator system of claim 20 wherein the communications protocol includes error detection.

24. The power generator system of claim 20 further comprising a plurality of power modules, each power module receiving an electrical energy input and generating an electrical energy output, at least one power module power module communicating with the sensor module via the digital interface.